The Determinants of Social Well-Being, Economic Development, and Development Index in the Third World Countries

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ABSTRACT The study's objective is to examine the relationship between social well-being and economic development in the Third World countries and the human resources, economical, social, and technological factors. Attempt the answer of following question: What factors contribute to the formation of social will-being and economic development? The patterns of development theory are used to answer this question. Secondary data were collected from various sources. The sample involved 103 from the Third World countries. The study was used hierarchical regression and recursive path analysis as statistical Methods. Results suggest that more than 66, 64, and 67 percent of the variance in social well-being, economic development, development index, respectively, are explained by total population, population growth rate, percent of urban population, total exports, health indicators, and energy consumption per capita. There is more support for patterns of development analysis of structural change by this study. Third World countries could change the structure of population policy, technique of international trade, investment in social infrastructure, and improve energy efficiency.

INTRODUCTION

Third World countries are facing severe development problems because the high rates of population growth, declining in per capita agricultural productivity, and the increasing migration of the rural poor to the large cities. At, the same time, resources for development are becoming scarcer. Exports from Third World countries to world markets have been decreasing, imports have increasing, debt-servicing problems have become more serious, and many governments depend heavily on declining sources of foreign aid. These nations account for 49 percent of the earth's land and 68 percent of the world's people (Kurian, 1992). It is difficult to imagine the poverty that characterizes of the Third World. Although wealthy nations have their pockets of poverty, most people in the Third world live on less than $1,000 a year (Sweezy and Magdoff, 1992).

The studies of social well being and economic development are the most challenging branches of the broader disciplines of the economic and political economy. In the recent years there has been a growing concern over precarious socio-economic conditions in the Third World countries (Deger and Smith, 1983; Chan, 1985; Fredricksen and Looney, 1985). That most Third World countries have failed to achieve a self-reliant society is obvious, judging from their current socioeconomic predicament. These countries need to be fed, houses, transportations, employs, programes of education, and provide good health care for their rapidly growing population (Thomas et al., 1993).

The objectives of this study are: (1) to examine the relationship between social well being and economic development in Third World countries and the human resources, economic, social, technological factors. (2) To identify the variables that are most significant in affecting development index. This study differs from earlier ones in the importance it assigns to social well being as a dependent variable. It combines social well being and economic development in development index as other dependent variable. Also, it incorporates a larger number of independent variables than previous studies. The findings will be useful for identifying policies that have the greatest promise for stimulating development.

Theoretical Framework

The interpretation of data will base on the patterns of development theory. According to Chenery (1979) in his empirical analysis, the patterns of the development of structural change focuses on the sequential process, this sequential process promotes the economic, industrial, and institutional structure of an underdeveloped economy. Moreover, the sequential processes

are transforming over time to allow new industries to replace traditional agriculture as the engine of economy growth. The original stage view of development, increased savings and investments are perceived by patterns of development analyst as necessary but not sufficient conditions for economic growth. Chenery and Syrquin (1975) argue that the accumulation of capital, both physical and human, a set of a country are required for the transition from a traditional economic system to a modern one. These structural changes involve nearly all-economic functions including the transformation of production and changes in the composition of consumer demand, international trade, and resource use as well as changes in socioeconomic factors such as urbanization and distribution of a country's population.

In addition to, the empirical structural-change analyst emphasize both domestic and international constraints on development. The domestic ones include economic constraints such as country's resource endowment and its physical and population size as well as institutional constraints such as government policies and objectives. To the extent that developing countries have reach to the opportunities presented by the industrial countries as sources of capital, technology, and manufactured imports as well as markets for exports. Developing countries can make the transition at an even faster rate than that achieved by the industrial countries during the early periods of their economic development. The structural change model recognizes the fact that developing countries are part of a highly integrated international system that can promote their development (Syrquin, 1989).

Literature Review

Most of the Third World nations share a set of a common and well-defined goals. These include the reduction of poverty, inequality, and unemployment, the provision of minimum levels of education, health, housing, and food to every citizen. Many problems are shared in general and in varying degrees by most developing countries. These are widespread and chronic absolute poverty; high levels of the unemployment and the underemployment; wide and growing disparities in the distribution of income. Also, there are low and stagnating levels of agricultural productiv-

ity; sizable and growing imbalances between urban and rural levels of living and economic opportunities; antiquated and inappropriate educational and health systems; severe balance of payments and international debt problems; and substantial and increasing dependence on foreign aid and on technologies. It is, therefore, possible and useful to talk about the similarity of development problems and to analyze them in a broad of the Third World perspective (Todaro 1971; LeBel, 1992; Kelein, 1993).

The relationship between economic development and population growth is currently a star attraction of world debate. Statistical Analysis clearly indicates that there is a negative association between them. Is the control of population growth a necessary precursor to economic development? Most developed countries argue that underdeveloped countries will be unable to move out of the vicious cycle of poverty unless population growth is brought under control (Coale and Hoover, 1958).

Goodman (1978) shows that all the Third World countries face serious difficulties. He attempts to distinguish the problem areas of the global system and those of the individual countries. He argues that the North-South discussions are an inappropriate forum and a generalized debt moratorium inappropriate remedy. Ginneken (1976) and Kelein (1993) attempt to analyze rural-urban differences in the income distribution and absolute living standards in fifteen countries. They conclude that urban inequalities are greater than rural inequalities in the two more urbanized and higher income.

Tyler (1980) in his study of economic development and export expansion in developing countries found a significant positive association between economic growth and investment, total exports, and manufacturing output in less developing countries. Balassa (1978) also found a significant and a positive relationship between economic development and export expansion.

Many governments in the Third World will rise or fall, depending on their success in managing their foreign debt. Sustainable growth is the only way the debtor countries can overcome this problem. According to Whitehead (1989) foreign debt levels in developing countries have grown enormously in the past decade. More than two

dozen of nations have faced problems in servicing their foreign debt since the debt crisis erupted in 1987.

Most large metropolitan areas and primary cities in Third World countries have created serious economic and social problems with most governments are unable to manage. The data from many studies indicate that low levels of education and health are always associated with low rates of social well being and economic development in Third World countries (Attwood et al., 1988; Whitehead, 1990; Moore, 1990; Thomas et al., 1993). Health and educational services become more severe with higher population (Kayila, 1984). Most of these countries simply cannot afford extensive formal education because most of their people work on their land or take care of the household, they find little need for education.

Eisenberg and Eisenberg (1979) argue that the cultural definition of health and sicknesses are closely linked to a country's level of technology and its ability to meet the needs of its population. In the Third World where infant mortality rates are high, life expectancies are low, and vaccines against controllable diseases are scarce, health and sickness take on very different meanings than they do in industrialized nations.

The study by Flavin and Durning (1988) assumed the Third World would use just 36 percent of the global energy supply in the year 2020. Such scenarios imply that while Third World energy use grows, per capita energy use will stagnate, presumably making it impossible for most developing countries to follow the modernization path taken by the newly industrializing nations in recent years. Although many developing nations are burdened with unmanageable foreign debt and have been priced out of the oil market, this is inconsistent with the articulated goals of the international development.

Other researchers argue that although the picture of life in many of the Third World countries is bleak, remember that in many countries incomes have been raised, infant mortality lowered, access to the education improved and life expectancy increased (Harold, 1975; Simon, 1993). Walsh (1974) and Ghura (1992) also confirmed that leaders of less developed nation have argued that the world economic system operates to their detriment. The developed nations of the West are charged with buying raw materials cheap from developing countries and selling manufactured goods dear, thus putting developing countries permanently in the role of the debtors and the dependents.

Based on the literature review and the theoretical framework discussed above underlay the following question: what factors contribute to the formation of social will-being, economic development, and development index in Third World countries? The patterns of development analysis of structural change are used to answer this question. It assumes that the development is an identifiable process of growth and change whose main features are similar in all countries. It asserts that factors influencing the development process include a country's human resource and resource endowment, policies and objectives, the international trade environment, and the availability of technology.

The current study examines and investigates the effects of human resources, economic, social, and technological factors upon social will-being, economic development, and development index. The human resources factors include total population size, population growth rate, and the relative size of the rural and urban population. Economic factors involve total number of labor force 15-64, total imports, total exports, and total external public debt. Social factors consist of percent of expenditure on public education and health indicator, used by a composite value of population per physician and hospital bed. Technological factors include energy consumption per capita and percent of expenditure on public transportation and communication.

METHODS

Data and Sample

Data were collected from various sources. These include the United Nations Statistical Yearbooks 1997, United Nations Demographic Yearbooks 1997, Social Indicators of Development published by World Bank 1997, and World Development Reports 1997. The sample involved 103 countries, 44 from Africa, 31 from Asia, 20 from South America, and 8 from Europe (Appendix A). According to World Bank Atlas method (1995), these countries are low and lower-middle income

groups and consider as Third World countries. Selected variables from each of these sources were chosen to represent the dependent and independent variables for this study. Measurement of the dependent and the independent variables used in the study explain in Appendix B.

Statistical Methods

Estimates of the amount of variance in social well being, economic development, and development index that can be explained by each of the independent variables separately and collectively will be made using hierarchical regression. Recursive path analysis will be used to estimate total association; joint spurious association; and total, direct and indirect effects of independent variables on social well being, economic development, and development index in Third World countries.

RESULTS

Results of Hierarchical Regression

In this section implies the results of the hierarchical regression analysis. It is used to estimate the effects of a set of independent variables on

the dependent variables included in this study.

First, the results of hierarchical regression related to social well being are presented in table 1. Model 1 displays only the human resources factors. The standardized regression coefficient for the population growth rate, -.432, and percent of urban population, .980, were statistically significant at level 01. The R^2 for this model was, .483, meaning that the human resource factors in model 1 explained 48.3 percent of the variance in social well being. Model 2 examines the impact of human resource factors and economic factors on social well being. The R^2, .501, explains 50.1 percent of the variance in social well being.

Model 3 in table 1 considers human resource, economic, and social factors that may affect social well being. The standardized regression coefficient for population growth rate, -.264, percent of urban population, .768, percent of public expenditure on education, .257, and health indicator, -.344, were statistically significant at level .05, .01, .05, and .01 respectively. This model shows 61.8 percent ($R^2 = .618$) of the variance in social well being.

Model 4 includes the four groups of factors. The standardized regression coefficient for the

Table 1: Hierarchical Regression of Social Well-Being in the Third World Countries [N =103]

Independent Variables	Social Well-Being							
	Mode 1		Mode 2		Mode 3		Mode4	
	B	Beta	B	Beta	B	Beta	B	Beta
Human Resources Factors								
Total population	-.044	-.053	-.225	-.269	-.103	-.123	-.177	-.211
Population growth rate	-.487	-.432**	-.437	-.388**	-.297	-.246**	-.266	-.237**
% of urban population	.617	.980**	.973**	.676	.484	.768**	.344	.547**
% of rural population	.136	.345	.219	.385	.185	.166	.248	.405
Economic Factors								
Total number of labor force			.108	.141	.145	.189	.156	.204
Total imports			-.113	-.155	-.175	-.240	-.150	-.207
Total exports			.234	.293	.267	.134	.186	.232
Total external public debts			-.002	-.003	.007	.010	.040	.058
Social Factors								
% of expenditure on education					.197	.257*	.131	.105
Health indicator					-.289	-.344**	-.216	-.267**
Technological Factors								
Energy consumption per capita							.321	.325**
% of expend. on transportation and communication							-.064	-.061
R^2		.483		.501		.618		.664
Adj. R^2		.462		.459		.576		.619
Sig. F		.000		.000		.000		.000

*p < .05,   **p < .01

population growth rate, -.237, percent of urban population, .547, health indicator, -.267, and energy consumption per capita, .325, were statistically significant at level .05, .01, .01, and .01 respectively. The results indicate that these variables were the best predictors of the given social well being. The results suggest that favorable social well being are more likely to occur among the Third World countries which are less population growth rate, more urban population, have a few number of people per physician and people per hospital bed, and use more energy consumption per capita. Model 4 considerably more variance in social well being, $R^2 = .664$, than the other models included in table 1.

Second, The results of the hierarchical regression related to second dependent variable, economic development, are presented in table 2. Model 1 includes the human resources factors. The standardized regression coefficient for population growth rate was the only statistically significant, -.259, at level .01. This model shows 47.7 percent ($R^2 = .477$) of the variance in economic development. Model 2 considers human resource factors and economic factors that may affect economic development. The standardized regression

coefficient for total population, -.455, population growth rate, -.266, percent of urban population, .637, and total exports, .460, were statistically significant at levels .01, .05, .01, and .05, respectively. All variables in this model are explained 54.4 percent of the variance in economic development.

Model 3 in table 2 examines the impact of human resource, economic, and social factors on economic development. The standardized regression coefficient for total population, -.358, percent of urban population, .445, total exports, .492, and health indicators, -.245, were statistically significant at levels .05, .05, .01, and .05, respectively. The R^2, .583, for this model explains 58.3 percent of the variance in economic development. Model 4 combines all independent variables. The standardized regression coefficient for total population, -.448, total exports, .372, health indicators, -.245, and energy consumption per capita, .376, were statistically significant at levels .01, .05, .05, and .01, respectively. This result implies that economic development increase among countries that have more total exports and use more energy consumption per capita. Also, increases in total population and number of people per physician and hospital bed were associated with decreases

Table 2: Hierarchical Regression of Economic Development in the Third World Countries [N =103]

Independent Variables	Social Well-Being							
	Mode 1		Mode 2		Mode 3		Mode4	
	B	Beta	B	Beta	B	Beta	B	Beta
Human Resources Factors								
Total population	-.108	-.131	-.372	-.455**	-.293	-.358*	-.367	-.448**
Population growth rate	-.285	-.259**	-.182	-.266*	-.090	-.081	-.050	-.046
% of urban population	.257	.218	.392	.637**	.274	.445*	.130	.211
% of rural population	-.098	-.163	.165	.175	.079	.132	.051	.185
Economic Factors								
Total number of labor force			.013	.017	-.002	.003	.011	.014
Total imports			.037	.052	.001	.002	.026	.036
Total exports			-.359	.460**	.384	.492**	.291	.372*
Total external public debts			-.015	-.021	.008	.012	.046	.067
Social Factors								
% of expenditure on education					.006	.005	.069	.056
Health indicator					-.201	-.245*	-.119	-.245*
Technological Factors								
Energy consumption per capita							.363	.376**
% of expend. on transportation and communication							-.042	-.041
R^2		.477		.583		.544		.611
Adj. R^2		.455		.505		.537		.553
Sig. F		.000		.000		.000		.000

*p < .05,   **p < .01

in economic development. All variables in this model explained a total of 61.1 percent of the variance in economic development.

Third, table 3 displays the results of hierarchical regression analysis for development index in Third World countries. In model 1, the results suggest that the standardized regression coefficient for population growth rate and percent of urban population, -.359 and .815, respectively, were statistically significant at level .01. The coefficient of determination, R^2= .484, indicates that the set of human resource factors in Model 1 explained 48.4 percent of the variance in development index. Model 2 examines the impact of human resources factors and economic factors on development index. The standardized regression coefficient for total population, -.413, population growth rate, -.284, percent of urban population, .994, percent of rural population, .331, and total exports, .322, were statistically significant at level .05, .05, .01, .05, and .05, respectively. Model 2 shows 52.4 percent, R^2 =.524, of the variance in development index by human resources factors and economic factors.

Model 3 in table 3 considers human resources, economic, and social factors that may affect development index. The standardized regression coefficient for percent of urban population, .723, percent of rural population, -.336, total export, .361, and health indicator, -.315, were statistically significant at level .01, .05, .05, and .05, respectively. This model shows 60.1 percent, R^2= .601, of the variance in development index. Model 4 in table 3 considers all the independent variables. The standardized regression coefficient for the total population, -.381, percent of rural population, .470, total export, .339, health indicator, -.292, and energy consumption per capita, .386, were statistically significant at levels .01, .01, .05, and .05, respectively. These variables were associated with development index in the Third World countries. The results indicate that increased development is more likely to occur among countries that have smaller population, more percent of urban population, have more exports, more number of physician and hospital bed for population, and use more energy consumption per capita. Model 4 shows considerably more variance in development index, R^2= .674, than the other models included table 3. It explains 67.4 percent of the total variance in development index by four groups of factors, human resources, economic,

Table 3: Hierarchical Regression of Development Index in the Third World Countries [N =103]

Independent Variables	Social Well-Being							
	Mode 1		Mode 2		Mode 3		Mode4	
	B	Beta	B	Beta	B	Beta	B	Beta
Human Resources Factors								
Total population	-.065	-.082	-.342	-.413*	-.221	-.281	-.299	-.381**
Population growth rate	-.379	-.359**	-.299	-.284*	-.181	-.172	-.145	-.138
% of urban population	.481	.815**	.587	.994**	.427	.723**	.278	.470**
% of rural population	-.175	-.305	-.363	-.331*	-.250	-.336*	-.215	-.274
Economic Factors								
Total number of labor force			.093	.129	.113	.157	.125	.174
Total imports			.015	.022	-.036	-.053	-.009	-.014
Total exports			.242	.322*	.270	.361*	.179	.339*
Total external public debts			-.002	-.003	.011	.017	.048	.073
Social Factors								
% of expenditure on education					.128	.109	.057	.049
Health indicator					-.248	-.315*	-.167	-.292*
Technological Factors								
Energy consumption per capita							.357	.386**
% of expend. on transportation and communication							-.058	-.059
R^2		.484		.524		.601		.674
Adj. R^2		.464		.484		.568		.630
Sig. F		.000		.000		.000		.000

*p < .05,   **p < .01

social, and technology.

RESULTS OF PATH ANALYSIS

This section provides the findings of path analysis. It is a method for explicitly formulating theory and attaching quantitative estimates to causal effects thought to exist a priori. It is used to illustrate the total, direct, and indirect effects of independent variables on dependent variables. A recursive path analysis model explains the relative impacts between endogenous and exogenous variables. The model uses development index as an endogenous variable, while intervening variables are economic development and social well being. It includes only the significant independent variables from the hierarchical regression analysis to determine the best predictor variables affecting development. Total population,

population growth rate, percent of urban population, total exports, health indicator, and energy consumption per capita are considering as exogenous variables.

Figure 1 presents the model of relationship in the Third World countries. For the first intervening variable, social well being, results indicate that the population growth rate, -.231, health indicator, -.287, and energy consumption per capita, .358, had statistically significant direct effects on social well being. The results also show that the total population, -.356, total exports, 381, energy consumption per capita, .261, and social well being, .410, had a statistically significant direct effect on economic development as a second intervening variable. Its display that health indicator, -.228, and energy consumption per capita, .202, had statistically significant indirect effects on economic development. These indirect effects
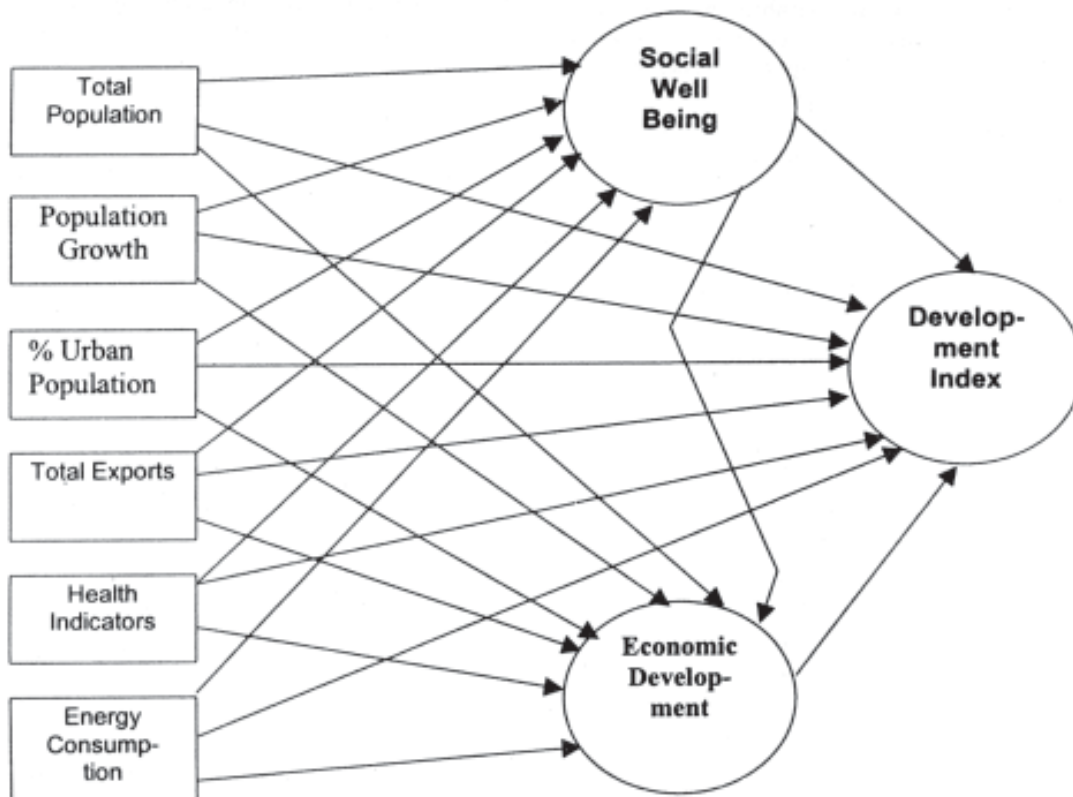

Fig. 1. Recursive Path Analysis Model of Social Well Being, Economic Development, and Development Index in Third World Countries

came from social well being.

The results of the analyses reveal that none of the exogenous variables have statistically significant direct effects on development index. While both of intervening variables, social well being and economic development, had statistically significant direct effects on development index, .588 and .493, respectively. Although there was a statistically significant indirect effect of population growth rate, -.232, health indicator, -.227, and energy consumption per capita, .283, from social well being on development index. In addition to, there was a statistically significant indirect effect of total population, -.196, total exports, .240, and social well being, .202, from economic development on development index.

Table 4 displays the decomposition of causal effects for figure 1. It presents the total association, joint spurious association, total effect, direct effect, and indirect effect of exogenous variables and intervening variables on endogenous variable. The results of recursive path analysis models state that total exports and energy consumption per capita are positively related to development. On the other hand total population, population growth rate, and increase number of

physician and hospital bed per population are negatively related to development. The analyses of hierarchical regression and recursive path consider one or more variables from all groups of factors effecting on social well being, economic development, and development index. The total population and the population growth rate from human resources factors, total exports from economic factors, number of physician and hospital bed per population from social factors, and finally energy consumption per capita from technological factors.

DISCUSSION

A primary concern of this study is what factors contribute to the formation of social will-being, economic development, and development index in the Third World countries? Human resources factors, economic factors, social factors, or technological factors. There is more support for patterns of development analysis of structural change by this study. According to patterns of development analysis and above results, Third World countries could be change the structure of the population policy, technique of international

Table 4: Interpretation of Associations and Effects in a Recursive Path Analysis Model of Social Well being, Economic Development, and Development Index in the Third World Countries

Dependent Variables	Predetermine Variables	Total Ass.	Joint Spuri-ous Ass.	Total Effect	Direct Effect	Indirect Effect Soc. Well-being	Eco. Dev.
Social Well-being	Total population	-.014	-.013	-.027	-.027	—	—
	Population growth	-.524**	.293	-.231*	-.231*	—	—
	% of urban population	.541**	.413	.128	.128	—	—
	Total Exports	.347**	.273	.074	.074	—	—
	Health indicator	-.573**	.286	-.287*	-.287*	—	—
	Energy consumption	.694**	.336	.358*	.358*	—	—
Economic Development	Total population	-.098	-.269	-.367**	-.356*	-.011	—
	Population growth	-.372*	-.326	-.046	-.048	.002	—
	% of urban population	.635**	.487	.148	.096	.052	—
	Total Exports	.409**	-.002	.411**	.381*	.030	—
	Health indicator	-.466**	-.225	-.241	-.013	-.228*	—
	Energy consumption	.700**	.237	.463**	.216*	.202*	—
	Social Well Being	.737**	.327	.410**	.410**	—	—
Development Index	Total population	-.047	-.103	-.210	.017	-.031	-.196*
	Population growth	-.464**	-.228	-.236	.073	-.232*	.023
	% of urban population	.597**	.478	.119	-.029	.101	.047
	Total Exports	.391**	.104	.287*	-.009	.058	.240*
	Health indicator	-.547**	-.309	-.238*	.001	-.227*	-.012
	Energy consumption	.729**	.332	.397*	.007	.283*	.107
	Social Well Being	.925**	.135	.790**	.588**	—	.202*
	Economic Development	.699**	.206	.493**	.493**	—	—

*p < .05, **p < .01

trade, investment in social infrastructure, and improve energy efficiency.

Results suggest that more than 66, 64, 67 percent of the variance in the social well being, economic development, development index, respectively, are explained by the study variables. The most significant variables are total population, population growth rate, percent of urban population, total exports, number of physician and hospital bed per population, and energy consumption per capita. The variances of these variables had the greatest impact on dependent variables. Moreover, there is evidence to support each variable, but in previous studies most researchers have recently gone into the idea that population growth must slow down before development can occur. Development may be influenced not only by rates of population growth, but also by its size.

Therefore, first basic needs strategy concern with the population policy and the investment in social infrastructure. It is directed toward raising the living standards of the poorest parts of the population. It is not generally concerned with providing consumer goods for immediate use, which might divert scarce resources. Rather, it tries to build human capital that will eventually provide the basis for economic growth. One aspect of first basic need strategy is to expand primary education. Educated population can probably find the skills needed to operate modern industrial equipment and to employ modern agricultural methods. A second aspect is trying to improve health conditions. Bringing doctors and nurses to rural village rather than allowing medical specialists. Helping village obtain clean drinking water and builds sanitation systems to dispose of waste. Making programs of mass inoculation and insect control to stoop killer diseases.

As people see their own living conditions begin to have positive effect on productivity. They become more willing to have their children educated, they become more confident in the future. Therefore, they adopt limit size of families and established have lower population growth rate. A third aspect of any policies with population pressures in the Third World countries must be to develop strategies for the distribution of investments; in social infrastructure, utilities, and communication services; between urban and rural areas.

Second basic need strategy regards with total exports of the Third World countries to the global market. Exports consisted of only a few products from mineral extractive and agricultural sectors. On other hand, goods, tariffs, and others technologies on imports into the industrialized countries are often very high. Therefore, they lose the revenue from value added by manufacturing and lose the stimulating development. A first aspect of this strategy, is to have consistently sought to restructure preferences to allow them to export more simple manufactures to industrial countries. Some improvements have been made by few of Third World countries.

A second aspect, trade can be an important stimulus to rapid economic growth. This has been amply demonstrated by the successful experiences of countries like Brazil, South Korea, and OPEC members. These countries have tried to increase and control the price of industrially important primary exports through the building of cartel agreements among themselves. There are a variety of weighty issues that need to be addressed. Economic cooperation is probably the most advanced of all the Third World countries. It focuses on exchange of views about the role to be taken to promote development. The fact that trade may promote expanded export earning, then increase output levels, that mean a desirable strategy for economic and social development. It all depends on the nature of the export sector.

Third basic need strategy regards with energy. The amounts of energy are required for agriculture, manufacturing, transportation, and daily living. In the poorer countries of Africa and Latin America, the rapid on set of an energy efficiency revolution are critical. Some Asian countries have sufficient fossil fuels to last for many decades but face a critical environmental choice. Using energy efficiency to display coal may be essential to protecting human health as well as the climate. Some improvements in Third World efficiency are projected for rural areas, as fuel wood cooking systems are replaced by more efficient devices run on renewable fuels. If energy efficiency is improving by 2 percent annually, it would help foster greatly in material living standards, then improve productive activities in industry and agriculture. Increasing energy efficiency and variety sources

of it may be a more effective way of achieving a goal of development.

APPENDIX A

44 Countries from Africa

Algeria, Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Veda, Central Africa Republic, Chad, Comers Island, Congo, Coated Iv., Djibouti, Eritrea, Ethiopia, Egypt, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Somalia, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zaire, Zambia, and Zimbabwe.

31 Countries from Asia

Afghanistan, Bangladesh, Bhutan, Cambodia, China, Fiji, Kiribati, Korea Dem. Rep., India, Indonesia, Iran, Iraq, Jordan, Lao PDR, Lebanon, Maldives, Mongolia, Myanmar, Nepal, Papua New Guinea, Pakistan, Philippines, Sri Lanka, Solomon Islands, Syria, Thailand, Tonga, Vanuatu, Vietnam, Western Samoa, and Yemen Rep.

20 Countries from South America

Belize, Bolivia, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Rep., Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, and Peru.

8 Countries from Europe

Albania, Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Rep., Poland, and Romania.

APPENDIX B

Measurement of Variables

The following is a brief statement on the variables to be used and their measurement.

The Dependent Variables: (1) Social well being is measured by a composite value that incorporates infant mortality rates, literacy rates, and life expectancy at birth. (2) Economic development is defined as per capita gross national product (GNP) per capita. (3) Development index is measured by a composite value of social well being and economic development. Gross national product, infant mortality rates, literacy rates, and life expectancy at birth Measured on scale of 1 to 5. The highest score for gross national product and life expectancy at birth is 5, while the lowest score is 1. The highest score for infant mortality rates and literacy rates is 1, while the lowest score is 5.

Independent Variables: (1) Total population index measured, at midyear in millions, on scale of 1 to 10. The highest size of population is 10 and the lowest is 1. (2) Population growth index or rate, the birth rate minus the death rate, implying the annual rate of population growth without regard for migration. Measured on scale of 1 to 5. The highest growth rate is 5 and the lowest is 1. (3) Urban population index measured on scale of 1 to 10. The highest size of urban population is 10 and the lowest is 1. (4) Rural population index measured on scale of 1 to 10. The highest size of rural population is 10 and the lowest is 1. (5) Total number of the labor force (15-64) as measured on scale of 1 to 6. The highest size of labor force is 6 and the lowest is 1. (6) Total exports the aggregate exports in millions of dollars. Measured on scale of 1 to 6. The highest number of exports is 6 and the lowest is 1. (7) Total imports the aggregate of imports in millions of dollars. Measured on scale of 1 to 6. The highest number of imports is 6 and the lowest is 1. (8) Total public external debt index, the aggregate public debt in millions of dollars. Measured on scale of 1 to 6. The highest debt is 6 and the lowest is 1. (9) Percent of expenditures on public education. Measured, as a percentage of gross domestic product (GDP), on scale of 1 to 5. The highest percent is 5 and the lowest is 1. (10) Health indicator. Measured, as population per physician and population per hospital bed, on scale of 1 to 5 for both. The highest number of people per physician or hospital bed is 5 and the lowest is 1. (11) Energy consumption per capita. Measured, as an annual consumption of commercial primary energy in kilograms of oil equivalent per capita, on scale of 1 to 5. The highest kilograms of oil equivalent per capita are 5 and the lowest are 1. (12) Percent of expenditures on transportation and communication. Measured, as a percentage of (GDP), on scale of 1 to 5. The highest percent is 5 and the lowest is 1.

REFERENCES

Attwood, Donald, Thomas Bruneau and John Galaty. 1988. *Power and Poverty:Development and Development Project In the Third World.* Boulder, Colo.: Westview Press.

Balassa, Bela. 1978. "Exports and Economic Growth: Further Evidence," *Journal of Development Economics,* 5: 181-189.

Chen, Steve. 1985. "Income Inequality among LCD's: A Comparative Analysis of Alternative Perspectives," *International Studies,* 33: 45-65.

Chenery, Hollis B. 1979. *Structural Change and Development Policy.* Baltimore, MD.: Johns Hopkins University Press.

Chenery, Hollis B. and Moshe Syrquin. 1975. *Patterns of Development,* 1950-70. London: Oxford University Press.

Coale, A., and E. Hoover. 1958. *Population Growth and Economic Development in Low Income Countries.* Princeton, NJ: Princeton University Press.

Deger, S. and R. Smith. 1983. "Military Expenditures, Spin-off and Economic Development Countries," *Journal of Conflict Resolution,* 27:335-353.

Eisenberg, A., and H. Eisenberg. 1979. *Alive and Well: Decisions in Health.* New York: McGraw-Hill.

Flavin, Christopher and Alan B. Durning 1988. *The Limits to Energy Growth. National Forum,* Summer 1988. Reprinted with permission of Worldwatch Institute.

Fredricksen and Looney, 1985. "Defense Expenditures and Economic Growth in Developing Countries," *Armed Forces and Society,* 11:298-301.

Ghura, D. and R. E. Just. 1992. "Education, Infrastructure

and Instability in East African Agriculture: Implications for Structural Adjustment Programs," *Journal of African Finance and Economic Development*, 1 (1): 85-105.

Ginneken, W. V. 1976. *Rural and Urban Income Inequalities In Developing Countries*. Geneva: International Labor Office.

Goodman, S. H. 1978. *Financing and Risk in Developing Countries*. New York: Praeger Publishers.

Harold, C., 1975. *Focus on the Fourth World. In World Development*. NY: Praeger.

Kelein, L. R. 1993. "Third World Economic Development: Situations and Prospects," *South African Journal of Economic*, 61 (4): 229-241.

Kayila, James O. 1984. "Urban Management in Kenya," in G. S. Cheema (ed.), *Managing Urban Development: Services for Poor*. Nagoya, Japan: United Nation Center for Regional Development.

Kurian, George Thomas. 1992. *Encyclopedia of the Third World*. Vol. 1 and 2. New York: Facts on File.

LeBel, P. 1992. "Economic Choices for Educational Policy in Africa," *Journal of African Finance and Economic Development*, 1 (1): 135-164.

Moore, M. 1990. "The Rational Choice Paradigm and the Allocation of Agricultural Development Resources," *Development and Change*, 21(2): 225-246.

Simon, D. 1993. "Understanding Urbanization," *Third World Quarterly*, 14 (2): 393-397.

Sweezy, Paul M., and Harry Magdoff. 1992. "Globalization-To what End?" Part II. *Monthly Review*, 43 (10): 1-19.

Syrquin, M., 1989. "Patterns of Structural Change," (pp. 205 – 273) in Hollis B. C & T. N. Srinivasan (eds.), *Handbook of Development Economics*. Vol.1. Amsterdam: North Holland..

Thomas, D., Victor, L., and John S. 1993. *Public Policy and Anthropometric Outcomes in Cote Devoir*. LSMS Working Paper Number 89. Washington, DC: World Bank.

Todaro, Michael P. 1971. *Development Planning: Models and Methods*. Nairobi: Oxford University Press.

Tyler, William G. 1980. "Growth and Export Expansion in Developing Countries," *Journal of Development Economics*, 9: 121-130.

Walsh, J. 1974. "UN Conference: Topping Any Agenda Is the Question of Development," *Science*, 185:11-44.

Whitehead, John C. 1989. *Third World Dilemma: More Debt or More Equity*. World Politics 88/89. Annual Editions. 146-150.

World Bank 1997. *World Development Report*, Washington, DC: World Bank.

World Bank 1997. *World Bank Atlas Method*. Washington, DC: World Bank.

World Bank 1997. *Social Indicators of Development*. Published for the World Bank. Baltimore and London: The Johns Hopkins University Press.

United Nations 1997. *Demographic Yearbooks*. New York: United Nations.

United Nations 1997. *Statistical Yearbooks*. New York: United Nations.